

PROCEEDING UNDER SECTION
122(h)(1) OF CERCLA,
42 U.S.C. § 9622(h)(1)

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I. JURISDICTION

1. This Agreement is entered into pursuant to the authority vested in the Administrator of the U.S. Environmental Protection Agency ("EPA") by Section 122(h)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. § 9622(h)(1), which authority has been delegated to the Regional Administrators of the EPA by EPA Delegation No. 14-14-D and redelegated to the Superfund Branch Chief by EPA Regional Delegation No. 1290-20.

2. This Agreement is made and entered into by EPA and NEC Acquisition Co., a California corporation ("Settling Party"). Settling Party consents to and will not contest EPA's authority to enter into this Agreement or to implement or enforce its terms.

II. BACKGROUND

3. This Agreement concerns the Sulphur Bank Mercury Mine Superfund Site ("Site") located in Lake County, California. EPA alleges that the Site is a "facility" as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

4. In response to the release or threatened release of hazardous substances at or from the Site, EPA undertook response actions at the Site pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604.

5. In performing a response action, EPA has incurred response costs at or in connection with the Site.

6. EPA alleges that Settling Party is a responsible party pursuant to Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), and is liable for Past Response Costs incurred at or in connection with the Site.

7. EPA and Settling Party recognize that this Agreement has been negotiated in good faith and that this Agreement is entered into without the admission or adjudication of any issue of fact or law.

III. PARTIES BOUND

8. This Agreement shall be binding upon EPA and upon Settling Party and its successors and assigns. Any change in ownership or corporate or other legal status of Settling Party, including, but not limited to, any transfer of assets or real or personal property, shall in no way alter Settling Party's responsibilities under this Agreement. Each signatory to this Agreement certifies that he or she is authorized to enter into the terms and conditions of this Agreement and to bind legally the party represented by him or her.

IV. DEFINITIONS

9. Unless otherwise expressly provided herein, terms used in this Agreement that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meanings assigned to them

in CERCLA or in such regulations. Whenever terms listed below are used in this Agreement or in any appendix attached hereto, the following definitions shall apply:

a. "Action Memorandum" shall mean the memorandum dated July 6, 2000, and prepared by EPA for the removal action at the Site concerning the closure and abandonment of geothermal wells. The Action Memorandum is attached as Appendix B.

b. "Agreement" shall mean this Agreement for Recovery of Past Response Costs and any attached appendices. In the event of conflict between this Agreement and any appendix, the Agreement shall control.

c. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9601, *et seq.*

d. "Day" shall mean a calendar day. In computing any period of time under this Agreement, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next working day.

e. "Effective Date" shall have the meaning given to it in Section XVII of this Agreement.

f. "EPA" shall mean the United States Environmental Protection Agency and any successor departments, agencies or instrumentalities of the United States.

g. "Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.¹

h. "Paragraph" shall mean a portion of this Agreement identified by an Arabic numeral or a lower case letter.

i. "Parties" shall mean EPA and Settling Party.

j. "Past Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that EPA, and the U.S. Department of Justice on behalf of EPA, has paid at or in connection with the Site through December 31, 2004, plus accrued Interest on all such costs through such date, for the removal action authorized in the Action Memorandum for the Site dated July 6, 2000, with respect to the closure and abandonment of the Clear Lake #1, Sulphur Bank #1, and "Gas Well" geothermal wells at the Site.

k. "Section" shall mean a portion of this Agreement identified by a Roman numeral.

l. "Settling Party" shall mean NEC Acquisition Co. and its officers and directors, if acting within the scope of their employment, and the following parents, subsidiaries and affiliates:

¹ The Superfund currently is invested in 52-week MK notes. The interest rate for these MK notes changes on October 1 of each year. Current and historical rates are available online at http://www.epa.gov/budget/finstatement/superfund/int_rate.htm.

Magma Power Company, Earth Energy, Inc., The Pure Oil Corporation, Union Oil Company of California, Unocal Corporation, Magma-Thermal Power Project, a California General Partnership, Magma Geysers, Inc., Magma Acquisition Corporation, Cert Environmental Corp., Fullerton Environmental Laboratory, Inc., Flowmole Environmental Services Corporation, and Thermal Remediation Corporation.

m. "Site" shall mean the Sulphur Bank Mercury Mine Superfund Site located in Lake County, California generally shown on the map included in Appendix A.

n. "United States" shall mean the United States of America, including its departments, agencies and instrumentalities.

V. PAYMENT OF RESPONSE COSTS

10. Payment of Past Response Costs to EPA. Within 10 Days after the Effective Date of this Agreement, Settling Party shall pay \$1.7 million to EPA.

11. Payment may be made to EPA by Electronic Funds Transfer ("EFT") in accordance with current EFT procedures to be provided to Settling Party by EPA Region IX.. Alternatively, payment may be made by certified or cashier's check made payable to "EPA Hazardous Substance Superfund." The EFT or check must be accompanied by a letter stating the name and address of the party making payment, the Site name ("Sulphur Bank Mercury Mine Superfund Site"), the EPA Region ("Region 9") and Site ID Number (09-K2), Spill ID Number (0902228), and the EPA CERCLA Docket Number 2005-01 for this action.

Settling Party shall send the check (and any accompanying letter) to:

EPA - Cincinnati Accounting Operations
Attention: Region 9 Receivables
P.O. Box 371099M
Pittsburgh, PA 15251

12. At the time of payment, Settling Party shall also send notice that payment has been made to EPA in accordance with Section XIII (Notices and Submissions). Such notice shall reference the EPA Region and Site/Spill ID Number 0902228 and the EPA docket number 2005-01 for this action.

13. The total amount to be paid pursuant to Paragraph 10 shall be deposited in the Sulphur Bank Mercury Mine Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

VI. FAILURE TO COMPLY WITH AGREEMENT

14. Interest on Late Payments. If Settling Party fails to make any payment required by Paragraph 10 by the required due date, Interest shall continue to accrue on the unpaid balance through the date of payment.

15. Stipulated Penalty.

a. If any amounts due to EPA under Paragraph 10 are not paid by the required date, Settling Party will be in violation of this Agreement and shall pay to EPA, as a stipulated penalty, in addition to the Interest required by Paragraph 14, \$2,500 per violation per day that such payment is late.

b. Stipulated penalties are due and payable within 30 days of the date of demand for payment of the penalties by EPA. All payments to EPA under this Paragraph shall be identified as "stipulated penalties" and shall be made payable to "EPA Hazardous Substance Superfund." The check, or a letter accompanying the check, shall reference the name and address of the party making payment, the Site name, the EPA Region and Site ID Number (09-K2), Spill ID Number (0902228), and the EPA CERCLA Docket Number 2005-01 for this action.

Settling Party shall send the check (and any accompanying letter) to:

EPA - Cincinnati Accounting Operations
Attention: Region 9 Receivables
P.O. Box 371099M
Pittsburgh, PA 15251

c. At the time of each payment, Settling Party shall also send notice that payment has been made to EPA in accordance with Section XIII (Notices and Submissions). Such notice shall identify the EPA Region and Site Spill ID Number 0902228 and the EPA Docket Number 2005-01 for this action.

d. Penalties shall accrue as provided in this Paragraph regardless of whether EPA has notified Settling Party of the violation or made a demand for payment, but need only be paid upon demand. All penalties shall begin to accrue on the day after payment is due and shall continue to accrue through the date of payment. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Agreement.

16. In addition to the Interest and Stipulated Penalty payments required by this Section and any other remedies or sanctions available to EPA by virtue of Settling Party's failure to comply with the requirements of this Agreement, Settling Party's failure or refusal to comply with the requirements of this Agreement shall be subject to enforcement action pursuant to Section 122(h)(3) of CERCLA, 42 U.S.C. § 9622(h)(3). If the United States, on behalf of EPA, brings an action to enforce this Agreement, Settling Party shall reimburse the United States for all costs of such action, including, but not limited to, costs of attorney time.

17. Notwithstanding any other provision of this Section, EPA may, in its unreviewable discretion, waive payment of any portion of the stipulated penalties that have accrued pursuant to this Agreement. Payment of stipulated penalties shall not excuse Settling Party from payment as required by Section V or from performance of any other requirements of this Agreement.

VII. COVENANT NOT TO SUE BY EPA

18. Covenant Not to Sue by EPA. Except as specifically provided in Section VIII (Reservations of Rights by EPA), EPA covenants not to sue or take administrative action against Settling Party pursuant to Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), to recover Past Response Costs. This covenant shall take effect upon receipt by EPA of all amounts required by Section V (Payment of Response Costs) and any amounts due under Section VI (Failure to Comply with Agreement). This covenant not to sue is conditioned upon the satisfactory performance by Settling Party of its obligations under this Agreement. This covenant not to sue extends only to Settling Party and does not extend to any other person.

VIII. RESERVATIONS OF RIGHTS BY EPA

19. EPA reserves, and this Agreement is without prejudice to, all rights against Settling Party with respect to all matters not expressly included within the Covenant Not to Sue by EPA in Paragraph 18. Notwithstanding any other provision of this Agreement, EPA reserves all rights against Settling Party with respect to:

- a. liability for failure of Settling Party to meet a requirement of this Agreement;
- b. liability for costs incurred or to be incurred by the United States that are not within the definition of Past Response Costs;
- c. liability for injunctive relief or administrative order enforcement under Section 106 of CERCLA, 42 U.S.C. § 9606;
- d. criminal liability; and
- e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments.

20. Nothing in this Agreement is intended to be nor shall it be construed as a release, covenant not to sue, or compromise of any claim or cause of action, administrative or judicial, civil or criminal, past or future, in law or in equity, which the United States may have against any person, firm, corporation or other entity not a signatory to this Agreement.

IX. COVENANT NOT TO SUE BY SETTLING PARTY

21. Settling Party covenants not to sue and agrees not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to Past Response Costs or this Agreement, including, but not limited to:

- a. any direct or indirect claim for reimbursement from the EPA Hazardous Substance Superfund based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;

b. any claims arising out of the response actions at the Site for which the Past Response Costs were incurred, including any claim under the United States Constitution, the Constitution of the State of California, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law; and

c. any claim against the United States pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613, relating to Past Response Costs.

22. Nothing in this Agreement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

X. EFFECT OF SETTLEMENT/CONTRIBUTION PROTECTION

23. Nothing in this Agreement shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this Agreement. The Parties expressly reserve any and all rights (including, but not limited to, any right to contribution), defenses, claims, demands, and causes of action that they may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a Party hereto.

24. EPA and Settling Party agree that the actions undertaken by Settling Party in accordance with this Agreement do not constitute an admission of any liability by Settling Party. Settling Party does not admit, and retains the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Agreement, the validity of the facts or allegations contained in Section II of this Agreement.

25. The Parties agree that Settling Party is entitled, as of the effective date of this Agreement, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), for "matters addressed" in this Agreement. The "matters addressed" in this Agreement are Past Response Costs.

26. Settling Party agrees that with respect to any suit or claim for contribution brought by it for matters related to this Agreement, it will notify EPA in writing no later than 60 days prior to the initiation of such suit or claim. Settling Party also agrees that, with respect to any suit or claim for contribution brought against it for matters related to this Agreement, it will notify EPA in writing within 10 days of service of the complaint or claim upon it. In addition, Settling Party shall notify EPA within 10 days of service or receipt of any Motion for Summary Judgment and within 10 days of receipt of any order from a court setting a case for trial, for matters related to this Agreement.

27. In any subsequent administrative or judicial proceeding initiated by EPA, or by the United States on behalf of EPA, for injunctive relief, recovery of response costs, or other relief relating to the Site, Settling Party shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, *res judicata*, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised in the subsequent proceeding were or should have been brought in the instant case; provided, however, that nothing in this Paragraph affects the enforceability of the covenant not to sue by EPA set forth in Section VII.

XI. SITE ACCESS

28. Notwithstanding any provision of this Agreement, EPA retains all of its access authorities and rights, as well as all of its rights to require land/water use restrictions, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statute or regulations.

XII. RETENTION OF RECORDS

29. Until 3 years after the effective date of this Agreement, Settling Party shall preserve and retain all records, reports, or information (hereinafter referred to as "records") now in its possession or control, or which come into its possession or control, that relate in any manner to response actions taken at the Site or to the liability of any person under CERCLA with respect to the Site, regardless of any corporate retention policy to the contrary.

30. After the conclusion of the 3-year document retention period in the preceding Paragraph, Settling Party shall notify EPA at least 90 days prior to the destruction of any such records and, upon request by EPA, Settling Party shall deliver any such records to EPA. Settling Party may assert that certain records are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Settling Party asserts such a privilege, it shall provide EPA with the following: 1) the title of the record; 2) the date of the record; 3) the name, title, affiliation (e.g., company or firm), and address of the author of the record; 4) the name and title of each addressee and recipient; 5) a description of the subject of the record; and 6) the privilege asserted. If a claim of privilege applies only to a portion of a record, the record shall be provided to EPA in redacted form to mask the privileged information only. Settling Party shall retain all records that it claims to be privileged until EPA has had a reasonable opportunity to dispute the privilege claim and any such dispute has been resolved in Settling Party's favor. However, no records created or generated pursuant to the requirements of this or any other settlement with the EPA pertaining to the Site shall be withheld on the grounds that they are privileged.

31. Settling Party hereby certifies that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, reports, or information relating to its potential liability regarding the Site since notification of potential liability by the United States regarding the Site and that it has fully complied with any and all EPA requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

XIII. NOTICES AND SUBMISSIONS

32. Whenever, under the terms of this Agreement, notice is required to be given or a document is required to be sent by one Party to another, it shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other Parties in writing. Written notice as specified herein shall constitute complete satisfaction of any written notice requirement of this Agreement with respect to EPA and Settling Party.

As to EPA:

Larry Bradfish, Assistant Regional Counsel
U.S. Environmental Protection Agency
Region IX
Office of Regional Counsel, ORC-3
75 Hawthorne Street
San Francisco, California 94105
Facsimile No. (415) 947-3570

As to Settling Party:

Jill A. Tracy
c/o NEC Acquisition Co.
376 Valencia Ave.
Brea, California 92923
Facsimile No. (714) 528-1213

XIV. INTEGRATION/APPENDICES

33. This Agreement and Appendices A and B constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Agreement. The Parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Agreement. The following appendices are attached to and incorporated into this Agreement: "Appendix A" is a map of the Site; "Appendix B" is the Action Memorandum, dated July 6, 2000.

XV. PUBLIC COMMENT

34. This Agreement shall be subject to a public comment period of not less than 30 days pursuant to Section 122(i) of CERCLA, 42 U.S.C. § 9622(i). In accordance with Section 122(i)(3) of CERCLA, EPA may modify or withdraw its consent to this Agreement if comments received disclose facts or considerations which indicate that this Agreement is inappropriate, improper or inadequate.

XVI. ATTORNEY GENERAL APPROVAL


35. The Attorney General or his designee has approved the settlement embodied in this Agreement in accordance with Section 122(h)(1) of CERCLA, 42 U.S.C. § 9622(h)(1).

XVII. EFFECTIVE DATE

36. The Effective Date of this Agreement shall be the date upon which EPA issues written notice that the public comment period pursuant to Paragraph 34 has closed and that comments received, if any, do not require modification of or EPA withdrawal from this Agreement.
IT IS SO AGREED:

U.S. Environmental Protection Agency

By:


Elizabeth Adams, Chief
Site Cleanup Branch, Region IX

Date:

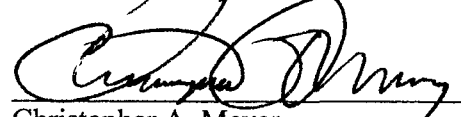
December 8, 2004

THE UNDERSIGNED SETTLING PARTY enters into this Agreement in the matter of U.S. EPA Region IX CERCLA Docket No. 2005-01, relating to the Sulphur Bank Mercury Mine Superfund Site:

FOR SETTLING PARTY:

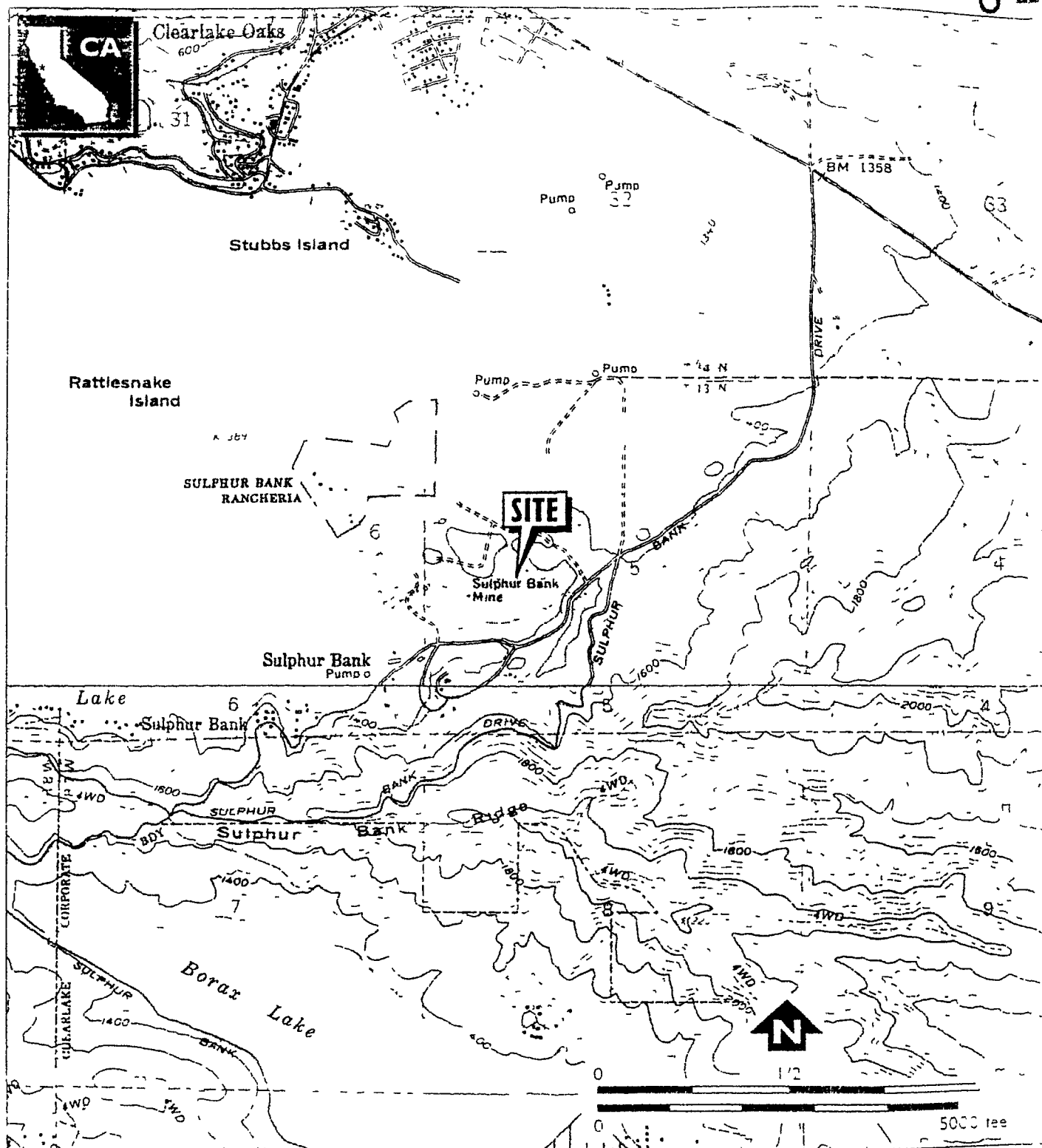
NEC ACQUISITION CO.
A California Corporation

By:


Christopher A. Meyer
Vice President

Date:

11/22/04



Ecology and Environment

Figure 1

Site Location Map
Sulphur Bank Mine Geothermal Site
 Clearlake Oaks Lake County, California

Dr No 2001 0025 01 R
 TDD 09 0012 0025
 Proj No 0025 01 R
 Date 01 23/2001
 File Z 60



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

40 REC-003 CT
2142-70702

AR0017

MEMORANDUM

DATE: June 28, 2000

SUBJECT: Request for Removal Action at the Sulphur Bank
Geothermal Site, located on the Sulphur Bank NPL
Site, Lake County CA.

FROM: William E. Lewis, OSC, Emergency Response Office *W. Lewis*

TO: Michael Feeley, Deputy Director, Superfund
Division

I. PURPOSE

The purpose of this Action Memo is to request and document approval of the proposed removal action described herein for the Sulphur Bank Geothermal Site, located on the Sulphur Bank NPL Site, Lake County, CA.

II. SITE CONDITIONS AND BACKGROUND

Site Status: NPL Site
Category of Removal: Time-Critical
CERCLIS ID: CA980893275
SITE ID: K2

A. Site Description

1. Removal site evaluation

The subject site is currently believed to be improperly/inadequately abandoned geothermal well field located on the Sulphur Bank NPL Site in Lake County, CA. The site currently includes four large diameter wells which were installed during the period 1961-1971. These wells are believed to have been installed as part of a pilot power production plan. A fifth small (about 4") diameter well is located in the same area. Construction details on this well are not available.

Although drill logs for the four large diameter wells are available in records currently held by the California Department of Oil, Gas and Geothermal Resources (CDOGGR), the wells were installed and abandoned prior to the establishment of regulatory authority by (CDOGGR). Based upon the lack of applicable regulations at the time as well as upon current field observations, CDOGGR is skeptical that the well abandonment procedures described in the logs were actually performed or are in compliance current regulations.

This well field was first brought to the attention of the Emergency Response Office (ERO) in May 2000 by Ken Stelling of CDOGGR based upon his concern about weakened well casings and the suspected improper abandonment procedures and the continuing hydrogen sulfide (H₂S) releases.

On June 1, 2000 EPA OSC William Lewis, EPA RPM Ellen Manges, START Member Tim Colen, Dick Thomas-CDOGGR, Ken Stelling-CDOGGR, Dan McMindes-USCOE and Greg Reller-Tetra Tech visited the site. The following observations were made:

1. All five wells are located in the same general area and within a few hundred yards of Herman Pit.
2. The field is located on the Sulphur Bank NPL Site and security is provided.
3. Two of the of the well heads are accessible on foot only, due to the lack of adequate roads.
4. Two of the well heads were observed to be severely corroded and in at least one case, H₂S was detected leaking through the cement plug.
5. The well field is located approximately ¼ mile from the Elem Nation (estimated population 70) and to an estimated 10 other private residences. The actual population that could potentially be impacted by a release from the field has not yet been determined.

2. Physical location

The Sulphur Bank Geothermal Field is located on the eastern shore of Clear Lake, south of Clearlake Oaks, in Lake County, California.

3. Site characteristics

The following table summarizes information extracted from the original well driller's logs.

SULPHUR BANK GEOTHERMAL WELLS				
	Clear Lake #1	Sulphur Bank #1	Bradley Mining #1	Bradley Mining #2
Owner *	Magma/HTPC	SBGC	Earth Energy	Earth Energy
Date Installed	Dec 61 - Jan 62	May 71	May-June 64	June-July 64
Total Depth, feet	1,294	546	2,089	3,985
Temperature, °F	327 @ 1,158'	?	407 @ 1,632	310 @ 3,032
Pressure, psi	?	"Ejects hot water and steam 15 ft into the air w/ large volume of steam"	733 @ 41 hrs of static test	Maybe not much
Notes	---	"Filled w/ cement, capped w/ steel plate." "Hazardous, a definite threat to life, health, property"	"Well abandoned, plugged, & capped" "CO ₂ produced almost blew out well"	"Well abandoned, plugged, & capped"

* Detailed owner information is included in the Enforcement Confidential Attachment to this document.

No records have been found for the fifth well in the field. This well is approximately four inches in diameter but its depth is not known. The well is not plugged and is releasing significant quantities of geothermal gasses including H₂S.

It is important to note that the drilling and abandonment records encountered to date cannot be specifically tied to particular well heads. Efforts to conduct a detailed survey of the wells in order to resolve this issue are in progress.

4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

As was previously stated, the geothermal wells at the Sulphur Bank Geothermal Site have been inactive for many years. Since the depths of the known wells range from 546 feet to 3,985 feet deep, the wells are filled with non-condensable gasses (NCG) containing carbon dioxide and lethal concentrations of hydrogen sulfide (H₂S). This occurs as the geothermal steam in the cooler, higher portions of the wells condenses over time and preferentially concentrates NCGs. Estimates of H₂S concentration

within the well casings, based on similar wells in the Geysers Geothermal Field, range from 30,000 to 40,000 parts per million (ppm). These levels are, however, not representative of average regional geothermal H₂S concentrations which range from about 300 to 800 ppm with a median of about 470 ppm. By way of comparison, a concentration of about 300 ppm is considered to be immediately dangerous to human life and health (IDLH).

The implication of this is that in the event of a sudden, catastrophic release of the pressurized well gas due to either corrosion or to mechanical impact, the first 'puff' of NCG released to the atmosphere would be extremely dangerous and potentially fatal to any people or animals exposed to the plume. Depending on the prevailing temperature, winds and other atmospheric conditions, lethal concentrations of H₂S could be reached hundreds of meters from the wellhead.

On the other hand, after the first puff is released, the steam representing 'average' concentrations of H₂S would probably not exceed nuisance levels when the dispersive nature of steam vented to the atmosphere is taken into consideration.

5. Site Security

Security at the Site continues to be provided.

6. NPL status

This facility is on the NPL.

7. Maps, pictures and other graphic representations

See Appendices to this Action Memo.

B. Other Actions to Date

It is unlikely that any activity has taken place in this field since the last well was drilled and abandoned in 1971. Although cement plugs are visible in three of the four large diameter wells, (one large diameter well head is buried) none of the visible well heads has been provided with a metal cap as claimed in the abandonment reports and it is apparent that the cement used does not meet standard requirements today.

C. State and Local Authorities's Roles

1. State and local actions to date

The four large diameter subject wells were drilled and abandoned prior to the establishment of CDOGGR regulatory authority. Thus, records concerning the abandonment are suspect and no closure bond was ever established. As this point, CDOGGR

claims to not have sufficient resources to properly abandon the wells. CDOGGR has no information on the small diameter well.

2. Potential for continued State/local response

CDOGGR has agreed to provide technical support during any abandonment process.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A. Threats to Public Health, or Welfare or the Environment

The substance of concern is hydrogen sulfide (H₂S). H₂S is a colorless, acidic gas, almost as toxic as hydrogen cyanide and between 5 and 6 times more toxic than carbon monoxide. H₂S gas may be present in hydrothermal fluids produced from geothermal wells.

The principal threat of H₂S to human life is poisoning by inhalation. Whenever H₂S gas is present, respiratory protection is of extreme importance. Upon exposure of H₂S concentrations of 100 ppm or above, the sense of smell is impaired in 2-15 minutes due to paralysis of the olfactory nerve (National Safety Council). In addition, death from exposure to still higher concentrations of H₂S can occur from lung paralysis before any odor is detected.

Exposure of concentration of H₂S of 800-1000 ppm may be fatal to humans in 30 minutes. High concentrations are instantly fatal. (Sax 1992)

1. Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations or the food chain

Hydrogen sulfide leakage due to a corroded casing and inadequate plugging has been observed in at least one of the large diameter wells. At the current time the observed leaks are small and the environmental impact is relatively minor. A continuous release of H₂S from the small diameter well reaches IDLH (immediately dangerous to life and health) levels for several feet downwind.

2. Actual or potential contamination of drinking water supplies

No contamination of a drinking water supply has yet been identified nor is it anticipated.

3. Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release

Not applicable.

4. High levels of hazardous substances or pollutants or contaminants in soils at or near the surface, that may migrate

Not applicable.

5. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released

One of the well heads is located a few feet from the edge of Herman Pit. Heavy rains and increasing water levels in Herman Pit occasionally flood the well head thus increasing access problems and accelerating the rate of casing corrosion.

6. Threat of fire or explosion

Hydrogen sulfide is a flammable gas which burns with a blue flame producing sulphur dioxide (SO₂). Like H₂S, SO₂ can cause serious injury as well as death to persons exposed to it.

7. Availability of other appropriate Federal or State response mechanisms to respond to the release

No other response mechanisms have been identified.

B. Threats to the Environment

The site is located on the eastern shore of Clear Lake. The area serves as a critical habitat for three endangered species - the Peregrine Falcon, the Southern Bald Eagle and the Yellow-Billed Cuckoo.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

The overall objective of this removal action will be to properly abandon the geothermal wells encountered on the Sulphur Bank NPL Site. To the extent practicable, abandonment will be conducted in compliance with current CDOGGR requirements.

1. Proposed action description

The major anticipated tasks that will be involved in the proposed response are as follows:

- a. Establish suitable access roads to all of the subject well heads. The road construction project which will require the use of heavy equipment and potentially blasting, should be completed in approximately two weeks.
- b. Conduct a proper abandonment of five subject wells. The abandonment process will be conducted in compliance with the regulations and guidance developed by CDOGGR to the extent that it is practicable.
- c. Perform air monitoring and sampling in accordance with OSHA requirements during all phases of the removal action, especially when there is a potential for airborne releases of toxic air contaminants.

2. Contribution to remedial performance

The long-term cleanup plan for the site:

The proposed EPA actions will address only the five identified geothermal wells. Long term cleanup at the site will continue to be addressed by the ongoing remedial process.

Threats that will require attention prior to the start of a long-term cleanup:

The immediate threats that have been identified in the Action Memo will be addressed by the proposed removal action.

The extent to which the removal will go to ensure that threats are adequately abated:

The procedures used in the well abandonment process have been defined by CDOGGR. The process involves the placement of extensive deep well cement and drilling mud plugs which have proved to be successful in the geothermal industry.

Consistency with the long-term remedy:

The procedures used in the well abandonment process have been defined by CDOGGR. The long term site remedy which will focus primarily on reduction of surface contamination from past mining operations is currently being addressed by the Remedial Program.

3. Description of alternative technologies

The approved methodology for geothermal well abandonment have been determined by CDOGGR. Alternatives have not been considered.

4. Applicable or relevant and appropriate requirements (ARARs)

Federal ARARs: Potential Federal ARARs are the Clean Water Act requirements; the RCRA Land Disposal Restrictions (LDRs); and the CERCLA Off-Site Disposal Policy. Off-site disposal is not anticipated at this time.

State ARARs: All well abandonment operations will be conducted in full compliance with regulations and guidance developed by CDOGGR. The OSC will request that DTSC, SWRCB and ARB provide EPA with potential State ARARs.

5. Project schedule

The estimated length of time needed to establish appropriate access as well as to perform the stabilization/well abandonment actions is four months.

B. Estimated Costs

Cost Projection Summary

ERRS Contractor	\$650,000.00
START Contractor	80,000.00
EPA	60,000.00
Project Contingency	100,000.00
Estimated Project Total	\$890,000.00

Cost estimates for the proper abandonment of geothermal wells are difficult under the best of circumstances; however, when the available records are old and incomplete, the process becomes even less precise. The cost estimates included here are based on EPA experience at the Unit 15 Site in Sonoma County, California, which was conducted in 1997.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Continued deterioration of the casings and cement plugs increase the likelihood of a catastrophic well failure and blowout. The resulting uncontrolled release of H₂S may be expected to severely impact nearby residents as well as wildlife in the area.

VII. OUTSTANDING POLICY ISSUES

None identified.

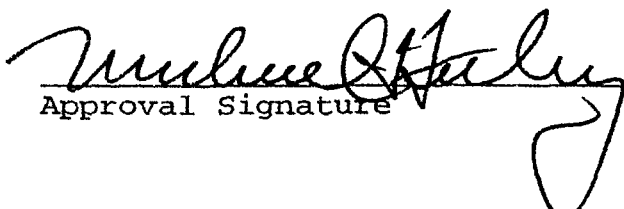
VIII. ENFORCEMENT

The Enforcement Addendum to this Action Memo contains confidential enforcement information.

IX. RECOMMENDATION

This decision document represents the selected removal action for the Sulphur Bank Geothermal Site, located in Lake County, California developed in accordance with CERCLA as amended, and not inconsistent with the NCP. This decision is based on the administrative record for the site.

Conditions at the site meet the NCP section 300.415(b)(2) criteria for a removal and I recommend your approval of the proposed removal action. The total project ceiling if approved will be \$ 890,000.00. Of this, an estimated \$ 650,000.00 comes from the Regional removal allowance.


Approval Signature

7/6/00
Date

Disapproval Signature

Date

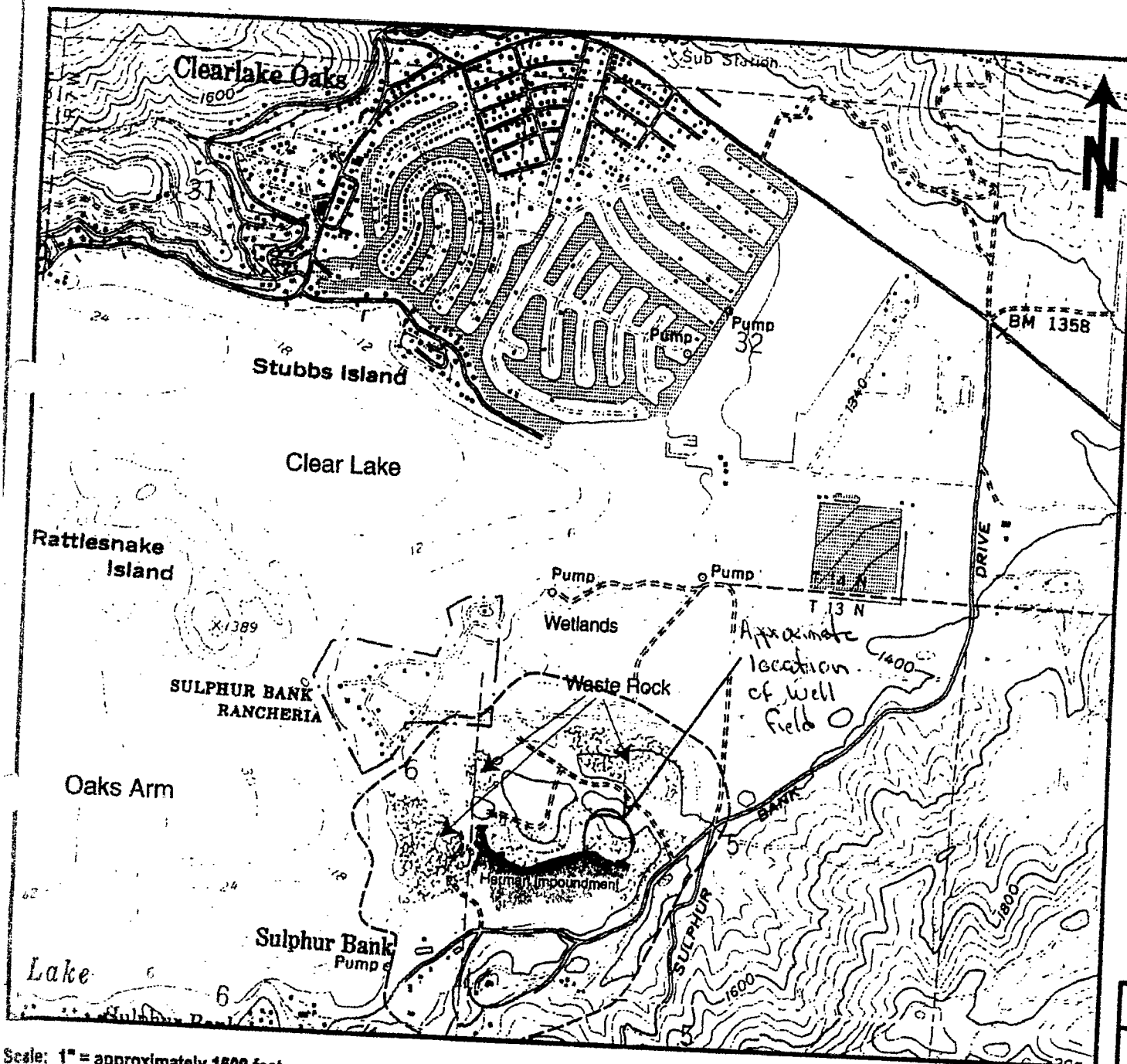


FIGURE 2-1

SITE LOCATION MAP
SULPHUR BANK MERCURY MINE
CLEARLAKE OAKS, CALIFORNIA

Scale: 1" = approximately 1600 feet
Contour Interval 40 feet

Source: USGS Topographic 7.5 minute quadrangle, Clearlake Oaks, California, 1993.



Small Diameter Well Head
Photo by T. Colen June 1, 2000



Third Well Head Encountered
Photo by T. Colen June 1, 2000



Fourth Well Head Encountered
Photo by T. Colen June 1, 2000



First Well Head Encountered
Photo by T. Colen
June 1, 2000



Second Well Head Encountered
Photo by T. Colen
June 1, 2000